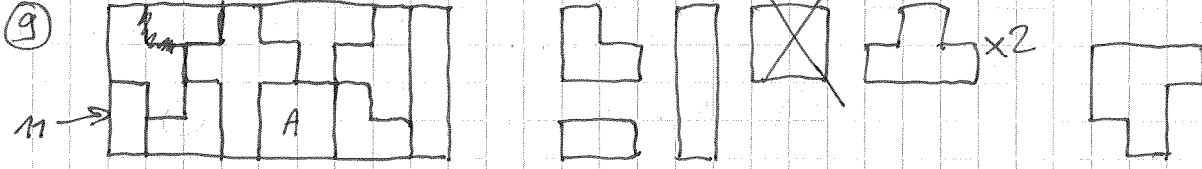


7



8 Mathieu: menteur  
 ⇒ Nico: vérité  
 ⇒ Marie: ment.

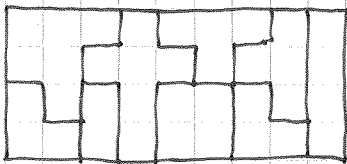
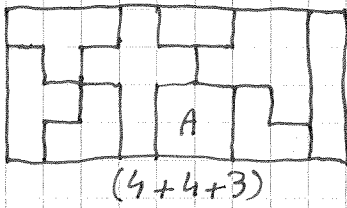
→ Mathieu



$$M = 6 + 3 + 2 = 4 + 4 + 3$$

→ En A: pas L ⇒ carré en A.

→ à droite.



3 sol°

10

$$(0,0) \rightarrow (3n, 2n) \rightarrow 3(n-p), 2(n+p) \rightarrow (3n-3p+2q, 2n+2p-3q)$$

$m, p, q \in \mathbb{Z}$

$$\begin{cases} 3n - 3p + 2q = 0 \\ 2n + 2p - 3q = 0 \end{cases}$$

$$\begin{cases} 2n - 2p + q = 0 \\ n + p - 2q = 0 \end{cases}$$

$$13n - 5p = 0$$

$$5n - 3p = 0$$

$$n = 5, p = 13, q = 12$$

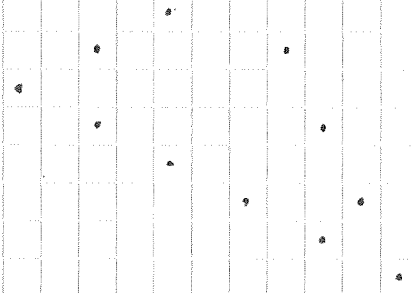
$$n = 3, p = 5, q = 4$$

→ 12

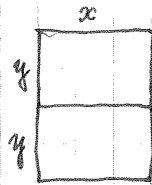
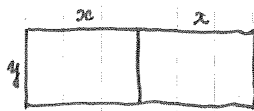
2/2

n

o



11



$$2x + 2y = 14 \text{ places par table}$$

Total: 24, 26 ou 28

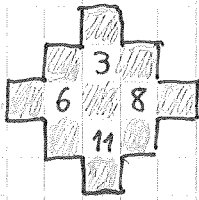
$$2x + y = 11$$

$$x + 2y = 10$$

$$\rightarrow x = 4, y = 3$$

Enfants:  $\boxed{12, 13 \text{ ou } 14}$  3 sol<sup>o</sup>  
(1 sol<sup>o</sup> demandée)

12



Carre sur case blanche

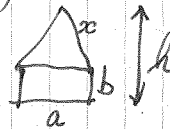
Carre sur case blanche  $\rightarrow$  4 sol<sup>o</sup>

(1 rect. contient tjrs 1 case blanche)

13

$$R = ab = \frac{ah}{2}$$

$$\boxed{b = \frac{h}{3}}$$



$$h^2 + 120^2 = 150^2$$

$$h = 30 (5^2 - 4^2)^{1/2} = 90 \rightarrow b = 30$$

$$4ab = 120 \times 90 \rightarrow a = 90$$

$$x^2 = 45^2 + 60^2 = 15^2 (3^2 + 4^2) = 15^2 \times 25$$

$$x = 15 \times 5 = 75$$

$$P = 2x + a = \boxed{240}$$

$\rightarrow$  cdu, ... Mq 1<sup>er</sup> chiffre est d et d=0

14

$$10^{k+1}a + 10^k b + c = 9 \times (10^k a + c), \quad k \geq 1$$

$$10^k a + 10^k b = 8c$$

$$10^k (a+b) = 8c$$

$$a+b = \frac{8c}{10^k}$$

$$10^k c \quad c < 10^k$$

$$\rightarrow k = 1, 2 \text{ ou } 3$$

•  $k=1 \rightarrow c=5, a+b=4$  (135, 225, 315, 405)

•  $k=2 \rightarrow c=25 \rightarrow a+b=2$  (~~125~~, 2025)

ou 75  $\rightarrow a+b=6$  (~~1575~~, ~~2475~~, ~~3375~~, ~~4275~~, ~~5175~~, ~~6075~~)

•  $k=3 \rightarrow c=125 \rightarrow a+b=1$  (10125)

ou 375  $a+b=3$  (~~12375~~, ~~21375~~, 30375)

ou 625  $a+b=5$  (~~14625~~, ~~23625~~, ~~32625~~, ~~41625~~, ~~50625~~)

ou 875  $a+b=7$  (~~16875~~, ~~25875~~, ~~34875~~, ~~43875~~, ~~52875~~, ~~61875~~, ~~70875~~)

$$\boxed{10125, 30375, 2025} \quad 3 \text{ sol}^o$$

15)  $b^2 - a^2 = 10^2 - 8^2$   ~~$b - a = \frac{76}{x}$~~

~~228~~ ~~2272~~  
~~228~~  
 $x = 6,75$ !

Côte:  $2x$

$\sqrt{(9+x)(x+1)(x-1)(9-x)}$

$\sqrt{(81-x^2)(x^2-1)} + \sqrt{(64-x^2)(x^2-4)} + \sqrt{(49-x^2)(x^2-1)}$   
 $= 4x^2 \frac{\sqrt{3}}{4} = x^2 \sqrt{3}$

$x = 27/4 \rightarrow \frac{729}{16} \times 1,7321$

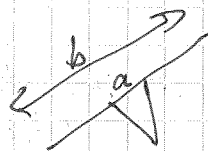
729  
 364,5  
 182,25  
 91,125  
 45,5625  $\times 1,7321$

31,89375  
 136,6875

45,5625  
 31,89375  
 1,366875  
 0,091125  
 0,4556

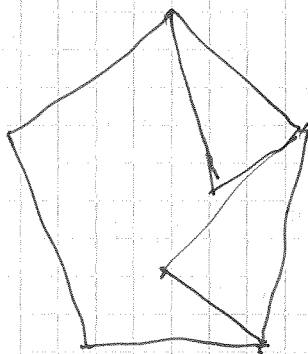
78,918806  
 78,92 ?

17)  $1 \text{ dm}^2 = 100 \text{ cm}^2$



$\frac{a}{b} ?$

~~120 cm~~  
~~155 cm~~



$100 + 20$

$120 + 24 = 144$

(3)

144  
 288  
 ---  
 172,8  
 34,56  
 ---  
 207,36  
 41,48  
 ---  
 248,84 ?

- 16
- |           |   |
|-----------|---|
| A         | B   |
| (1, 1)    | (3, 2)                                    |
| C(4, 6)   | D(11, 7)                                  |
| E(12, 19) | F(32, 20)                                 |
| G(33, 53) | H(87, 54)                                 |
|           | <del>(x<sub>i</sub>, y<sub>i</sub>)</del> |
|           | (x <sub>n</sub> , y <sub>n</sub> )        |

$$y_n = x_{n-1} + y_{n-1} + 2$$

$$x_n = 2x_{n-1} + y_{n-1} + 3 = x_{n-1} + y_n + 1$$

H(87, 54)	J(231, 143)
L(608, 376)	N(1595, 986)
P(4173, 2583)	R(10944, 6767)
T(28655, 17710)	V(75023, 46367)
X(196416, 121392)	
Z(514227, 317810)	

18

$$N = a^2 + b^2 = c^2 + d^2$$

$$1752 + 907i$$

$$1172 + 1587i$$

→ PGCD

$$580 - 680i$$

na

$$29 \times 29 = 841$$

~~1160 + 1388i~~

$$4 \times 289$$

$$29 - 34i$$

$$29^2 + 34^2 = 841 + 1156 = 1997$$

$$\begin{array}{r} 3892 \ 153 \ | \ 1997 \\ \underline{1997} \\ 1895 \ 1 \\ \underline{17973} \\ 9785 \\ \underline{7988} \\ 17973 \\ \underline{17973} \\ 0 \end{array}$$

$$1949$$

$$18000 - 27$$

$$1949 \times 1997$$

$$\begin{array}{r} 111 \\ \underline{37} \\ 148 \\ \underline{37} \\ 185 \end{array}$$

$$164$$

$$205$$

$$129$$

$$34$$

$$141$$

$$188$$

1949 ~~x x x x x x x x x x x x x x x x~~

1997